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         Ethnically Diverse Women: The Role of Biopsychosocial
         Factors

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Breast cancer incidence and mortality vary substantially by ethnic group which makes ethnicity a likely marker for understudied social, attitudinal, and behavioral risks. Ethnic-specific cultural norms and beliefs affect health-related perceptions which may influence early detection practices. In this dissertation we examined ethnic models of breast exams (breast self-examination (BSE) and clinical breast examination (CBE)) in order to identify facilitators and barriers to detection. We analyzed data on low-income, ethnically diverse women in South Florida using multivariate statistical techniques. Independent variables included: socio-demographic characteristics, psychosocial factors (e.g., health beliefs, personal and religious community networks), structural barriers (e.g., unmet basic needs, worry over basic needs), and lifestyle behaviors (diet, exercise, smoking). Results revealed that predictors of breast cancer detection vary considerably by ethnic group and breast exam. Monthly BSE is associated to community networks among Latinas and to worrying about basic needs among White women. Being current on CBE is associated to religious community networking among Black women and to worrying about basic needs among Latinas. Finally, preventive behaviors such as exercise and smoking are associated to BSE and CBE differently across ethnic groups. This information is important for designing effective breast cancer prevention programs targeted at culturally diverse at risk populations.

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Introduction

The underlying purpose of my graduate work has been to identify how race and ethnicity affect health-related behaviors and outcomes among women. This general interest in women's health has led me to focus on women's breast cancer self-protective behaviors including both lifestyle (smoking, alcohol, diet) and early detection. My overall objective is to broaden my knowledge and experience in breast cancer prevention and control in an interdisciplinary context in order to design, implement, and evaluate community-based prevention programs for underserved populations. The pre-doctoral award supported the last step of my doctoral degree, my dissertation, which allowed me to start my career as a breast cancer researcher with a focus on psychosocial and contextual factors that may contribute to racial/ethnic disparities in cancer morbidity and mortality.

Body

The pre-doctoral training grant supported the secondary data analysis of existing data and writing of my dissertation (Breast Cancer Protective Behaviors Among Low-Income Ethnically Diverse Women: The Role of Psychosocial and Structural Factors) which was sent to your institution at the end of November[1].

This work illustrates the importance of conceptualizing early detection as behaviors subject to a variety of complex factors, including individual beliefs and attitudes, personal and community-level support, structural barriers, and preventive behaviors. Our findings show that religious social networks, lack of social benefits and lack of time for oneself have significant effects on compliance with regular breast exams. They also show that the relationship between preventive behaviors and detection behaviors may be stronger than previously thought if we measure prevention behaviors more accurately than in previous literature.

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[1]The reason for sending the manuscript and this report separately is that I had to leave the country unexpectedly, for an extended period of time, due to the death of a close family member before I could finish this report.

An important finding emerging from this work is the consistent difference in factors that predict breast exams across ethnic groups. Even when the direction of the effect is the same, the size of these effects vary considerably which suggests that breast cancer early detection represent different actions, are perceived as different behaviors, or confront different barriers in each cultural group. A substantial portion of past research has paid little attention to cultural aspects of health behaviors assuming that prevention is a universal value and that everyone seeks to ward off disease similarly if they have the right information. However, as our ethnicity-specific models show, cultural heritage interacts with the role of motivators and barriers to health protective behaviors. Further, cultural heritage creates different realities, thus, psychosocial factors and structural barriers are likely to play different roles in protective behaviors in women of diverse ethnic background.

So what have we learned from this research? We should account for these differences when designing health interventions and messages and keep in mind the difficulty in devising a social psychological model of health behavior using micro and macro elements of individual health decisions. In this specific case, both macro (e.g. structural barriers, social control/support from community networks) and micro elements of the models (e.g. personal networks, attitudes toward health, preventive behaviors) are influenced by two other macro-level structures: cultural heritage which encompasses beliefs, attitudes, traditions, and the dynamics of a non-white enclave as we discuss in the conclusion of the dissertation in detail. The extreme difficulty of capturing this complexity in cost-effective programs may explain the large proportion of unsuccessful health campaigns. Health policy implications of the conclusions reached in this research are included at the end of the manuscript.

Key Research Accomplishments

- Completion of doctoral dissertation (Director: D.F. Sly)
- Graduation from doctoral program at Florida State University

- Awarded 2-year NIH post-doctoral research fellowship at Yale University School of Medicine, Department of Epidemiology and Public Health (Mentor: Dr. Beth A. Jones) (DOD Breast Cancer Research Program Grantee)
- Manuscripts submitted for publication and currently under review: 2
- Presentations at professional meetings from September 2002 through June 2003: 5
- Manuscripts in process: 5
- Grant proposals in process: 2

List of Reportable Outcomes

1. The pre-doctoral award supported the development and completion of my doctoral dissertation and, thus, doctoral degree in Social Demography from Florida State University under the direction of Dr. David F. Sly.

2. This award was instrumental in receiving several invitations for interviews for post-doctoral positions at high quality institutions (Brown University, Harvard University, University of Houston/Baylor Medical School, University of North Carolina-Chapel Hill, University of Pennsylvania, and Yale University).

3. I accepted Yale University School of Medicine offer to work with Dr. Beth A. Jones as my mentor, she is a recipient of a AMRMC Breast Cancer Research award.

    a. As part of my post-doctoral fellowship, I have been analyzing data and preparing presentations and manuscripts (see below) based on the data from the following projects:

        i. Race Differences in Breast Cancer Survival (B.A. Jones, P.I., supported by U.S. Army Medical Research and Materiel Command (DAMD-17-96-1-6101))

        ii. Race Differences in Adherence to Mammography Screening Guidelines (B.A. Jones, P.I., supported by RO1-CA-CA70731 from the National Cancer Institute)

    b. I continue to collaborate with the director of my dissertation (Dr. D.F. Sly) on manuscripts based on the dissertation work at Florida State University,

presenting findings in national meetings, and writing grant proposals (see below)

4. Two grant proposals in process:

    a. The Role of Partners' Health Attitudes and Behaviors on Low-Income, Ethnically Diverse Women's Breast and Cervical Cancer Protective Behaviors (in collaboration with Dr. D.F. Sly)

    b. The Influence of Neighborhood-level Characteristics on the Long-Term Survival of African-American and White Women Diagnosed With Breast Cancer—A Population-Based Study (in collaboration with Dr. B.A. Jones and Dr. S.V. Kasl)

5. Presentations at Professional Meetings from September 2002 through June 2003

    a. Era of Hope meeting, Orlando, FL. September 2002 (poster)

    b. American Public Health Association meeting, Philadelphia, PA. November 2002 (oral)

    c. American Society of Preventive Oncology (ASPO) meeting, Philadelphia, PA. March 2003 (2 posters) (abstracts accepted)

    d. National Conference on Chronic Disease Prevention and Control (NCCDPC) meeting, St. Louis, MO. February, 2003 (oral) (abstract accepted)

    e. Society for Epidemiological Research (SER) meeting, Atlanta, GA. June 2003 (abstract submitted)

- Manuscripts submitted for publication

    a. Prognostic Significance of Psychosocial Factors in African-American and White Breast Cancer Patients: A population-Based Study. Authors: **H. Soler-Vila**, S.V. Kasl, and B.A. Jones. Under review at *American Journal of Epidemiology*

    b. African-American/White Differences in Breast Cancer Tumors: p53 Alterations and Other Markers Associated with Poor Prognosis. B.A. Jones, S.V. Kasl, C.L. Howe, M. Lachman, R. Dubrow, M.M. Curnen, **H. Soler-Vila** et al. Under review at *Cancer, Epidemiology, Biomarkers & Prevention*. Presented at DOD Era of Hope meeting, Orlando, FL. September, 2002.

- Five manuscripts in process
  a. Clinical Breast Examination Among Low-Income, Ethnically Diverse Women: Social and Lifestyle Correlates. Authors: **H. Soler-Vila** and D.F. Sly (presented at APHA 2002)
  b. The Influence of Psychosocial Factors on Breast Cancer Screening among Multicultural, Low-Income, Premenopausal Women. Authors: **H. Soler-Vila** and D.F. Sly (to be presented at NCCDP 2003)
  c. Stressful Life Events and Adherence to Mammography Screening Guidelines Among African-American and White Women. Authors: **H. Soler-Vila**, L. Calvocoressi, S.V. Kasl, and B.A. Jones. (to be presented at ASPO 2003)
  d. Cervical Cancer Screening Among Women at Risk for HIV: Psychosocial and Lifestyle Correlates. Authors: **H. Soler-Vila** and D.F. Sly (to be presented at ASPO 2003)
  e. Obesity and Survival in a Cohort of African-American and White Women with Breast Cancer. B.A. Jones, C. Dallal, **H. Soler-Vila**, S.V. Kasl, D. Zelterman, M. Lachman, C. Howe, and F. Duan (Submitted to SER 2003)

Conclusions

The work involved in my dissertation introduced me to the social epidemiology of breast cancer and the complexity of studying ethnically diverse populations. The acquired skills and knowledge as a result of this training made me a more attractive candidate for a research center with top quality research in this area as is the Department of Epidemiology and Public Health at Yale University School of Medicine. In this interdisciplinary environment I am currently involved in two projects directed at reducing ethnic differences in breast cancer mortality while pursuing further work based on my dissertation research. Two grant proposals, one based on the dissertation work, are being prepared to further knowledge of racial/ethnic disparities regarding breast cancer mortality. This training at Yale University will, undoubtedly, provide me with the necessary skills for a productive research career in breast cancer prevention and control with a focus on low-income and ethnically diverse populations.

Appendix I

Changes to the proposed training

Due to timing of events, I completed the dissertation and was offered the post-doctoral fellowship at Yale University School of Medicine before the end of the grant period. My acceptance of the position created an obvious conflict and made it impossible to undertake part of the proposed training under the award, i.e., spending an extended period of time doing field research in Miami, Fl under the supervision of Dr. Edward Trapido of University of Miami. After careful examination and deliberation with my Ph.D. mentor, Dr. Sly, we decided to refuse the part of the award that covered the expenses associated with said field training (my salary and expenses) after getting approval from the grant administrator. The result is that from the $22,000 total award, I received $8,000 out of the $16,000 for salary, which covered the time I was working of the dissertation, and returned the rest.

Appendix II

Abstracts of articles under review

Prognostic Significance of Psychosocial Factors in African-American and White Breast Cancer Patients: A Population-Based Study. **H. Soler-Vila**, S.V. Kasl, B.A. Jones. American Journal of Epidemiology

Abstract

The authors examined the effects of emotional support, coping styles, fatalism, and health locus of control on survival for a population-based sample of 145 African-American and 177 White women diagnosed with breast cancer in Connecticut, U.S., between January, 1987 and March, 1989 and who were followed for over 10 years (11.6 years on average). Lower baseline levels of perceived emotional support ("Cancer is a topic I can talk about freely with my friends/relatives") were associated with a higher risk of death from any cause (hazards ratio=1.39, 95% confidence interval (CI)=1.07, 1.80) and from breast cancer (hazards ratio=1.43, 95% CI=1.07, 1.92). Multivariate Cox proportional hazards models adjusted for socio-demographic (race/ethnicity, socio-economic status, insurance coverage, marital status), biomedical (TNM (tumor-node-metastasis) stage, histologic grade, comorbidity, obesity, menopausal status, additional tumor characteristics), treatment received, and lifestyle variables (tobacco and alcohol consumption). These results suggest that among African-American and White women followed for 10 years after diagnosis with breast cancer, perceived emotional support, defined as having someone to talk to about the disease, is a significant predictor of survival.

African American/White Differences in Breast Cancer Tumors: p53 Alterations and Other Markers Associated with Poor Prognosis. B.A. Jones, S.V. Kasl, C.L. Howe, M. Lachman, R. Dubrow, M. McCrea Curnen, **H. Soler-Vila**, A. Beeghly, F. Duan, P. Owens.

Abstract

There is mounting evidence that breast tumors in African American (AA) women are more aggressive than those in White (W) women, yet there is limited information on racial/ethnic differences in genetic alterations that may be of prognostic importance. This study compared tumor characteristics and selected genetic alterations on a population-based cohort of AA (n = 145) and W (n = 177) women who were diagnosed with breast cancer in 22 Connecticut hospitals, January, 1987 - May, 1989. Using standardized methodology, we evaluated archived tumor tissue for selected genetic alterations (p53, HER-2/*neu* (HER2), c-*met*), as well as established prognostic indicators. Tumors from AA (vs. W) women were more likely to be positive for p53 alterations as measured by immunohistochemistry (Odds Ratio (OR) 4.00, 95% Confidence Interval (CI) 1.77-9.01) and to have more A:T to G:C mutations (DNA sequencing). No racial/ethnic differences in HER2 were observed, yet tumors in AA women were more likely to express c-*met* (multivariate analysis, p = .10). Other significant findings included later TNM stage, higher histologic grade, higher nuclear grade, and more estrogen receptor negative (ER⁻) tumors in AA compared with W women. Tumors in AA (vs. W) women were also more likely to be in the high-risk category on multiple factors (e.g., ER⁻ PR⁻ (PR = progesterone receptor). Adjusting for potential confounders (interview and medical record data), this study confirms that tumors in AA women are likely more aggressive than those in W women and offers new evidence for racial/ethnic differences in p53 and possibly c-*met*.

Appendix III
Abstracts for professional presentations

Poster Presented at DOD Era of Hope meeting, Orlando, FL. September 2002

BREAST CANCER DETECTION BEHAVIORS AMONG LOW-INCOME WOMEN. EXPLORING THE ROLE OF ETHNICITY AND PSYCHOSOCIAL FACTORS ON BREAST EXAMS. **H. Soler-Vila.**

Breast cancer incidence and mortality vary substantially by ethnic group which makes ethnicity a likely marker for understudied social, attitudinal, and behavioral risks. Ethnic-specific cultural norms and beliefs affect health-related perceptions may influence early detection practices. In this dissertation we examine ethnic models of breast exams (breast self-examination (BSE) and clinical breast examination (CBE)) in order to identify facilitators and barriers to detection.

We analyze data on low-income, low-education, ethnically diverse women of reproductive age residing in South Florida using multivariate statistical techniques. Independent variables include: socio-demographic characteristics, psychosocial factors (e.g., health self-efficacy, perceived control over one's health, perceived vulnerability to breast cancer, health value, individual- and community-level support), and contextual barriers (unmet basic needs and level of worry about these needs).

Results reveal that predictors of breast cancer detection vary by ethnic group and exam. For instance, community networks increase the likelihood of monthly BSE (but not of current CBE) among Latinas. Similarly, worrying about basic needs has a positive effect on BSE frequency, but not CBE frequency, among white women only. In turn, whereas community networks are associated to current CBE among black women but not among other women, worrying about basic needs increases the chances of Hispanic women of being current on their CBE. Finally, preventive behaviors such as exercise and smoking are associated to BSE and CBE differently across ethnic groups.

These findings underscore the influence of psychosocial factors on early detection and how these effects vary by ethnicity. The existence of variations is important for designing health interventions and messages customized to cultural and socio-economic context, as well as to specific breast exam. These findings may assist further tailoring of breast cancer prevention programs to at-risk populations.

Oral presentation, 130th Annual Meeting of the American Public Health Association, November 12th, 2002, session 4032.0 "Social and Lifestyle Determinants of Health."

Clinical breast examination among low-income ethnically diverse women: Social and lifestyle correlates. **H. Soler-Vila**, D. F. Sly, , D. Quadagno, D. F. Harrison, I. W. Eberstein.

Breast cancer early detection varies substantially by race/ethnic group, which suggests ethnicity as a social marker for understudied attitudinal risks. Ethnic-specific cultural norms and beliefs influence health-related perceptions such as vulnerability to illnesses, benefits from health behaviors, control over one's health, and access to resources as well as their role on detection. We examined data on 551 low-income, ethnically diverse pre-menopausal women in South Florida using ethnicity-specific models to identify social and lifestyle correlates of recent clinical breast exams (CBE). Social factors included locus of control, religious involvement, unmet basic needs, and level of worry about those needs. Lifestyle factors included smoking, physical activity, nutrition, and obesity. Results revealed early detection correlates vary widely by ethnic group. Religious attendance and exercise showed strong associations with CBE among African-American women only. Relationships between unmet basic needs and CBE run in opposite directions for African-Americans and Whites, and worrying about basic needs and locus of control were associated with CBE among Hispanics. For all women, obesity was associated with recent breast exam and, contrary to expectations, both heavy and light smokers were as likely to practice early detection as non-smokers. Findings underscore the importance of incorporating psychosocial and lifestyle variables to the study of detection behaviors among low-income women while acknowledging the influence of ethnic and cultural norms on how these variables relate to cancer detection. These variations are key for designing health interventions and customizing public health messages as well as for raising awareness among health providers servicing these populations.

Abstract submitted to the 17th National Conference on Chronic Disease Prevention and Control *Gateway to Lifelong Health:The Community Connection* February 19 – 21, 2003; St. Louis, Missouri

The Influence of Psychosocial Factors on Breast Cancer Screening among Multicultural, Low-Income, Premenopausal Women. **H. Soler-Vila**, DF. Sly

Objective: To examine associations between psychosocial factors and breast cancer screening in under-studied, under-served, multicultural populations.

Setting: Eliminating ethnic disparities in breast cancer mortality, especially African-American (AA) disadvantage, is a major item in women's health agenda. We recruited participants from 21 public health and public assistance agencies in South Florida (US) in 1994-95.

Method: Results are based on a larger study's baseline data from in-person interviews of 551 women (26% AA, 32% White, and 41% Hispanic) age 18-45 who were at risk for HIV/STD infection. We examined relationships between two types of social support: community level (church attendance) and personal level (having a *confidant*), health beliefs (locus of control, importance of health) and frequency of two exams: Breast Self-Exam (BSE) and Clinical Breast Exam (CBE). We investigated these associations within ethnic groups and acculturation levels (Hispanics). Multivariate analyses controlled for known socio-economic predictors of screening behaviors.

Result: Psychosocial factors and screening practices varied substantially by ethnicity. Social support, but no health belief, was associated with monthly BSE. However, both social support and health beliefs were positively associated with current CBE. Some of these findings vary by ethnicity but not by acculturation level.

Conclusion: Psychosocial factors, especially lack of social support and perceived control over one's health, are potential barriers to screening. Observed ethnic variations are crucial for designing health interventions, customizing public health messages, and educating health providers servicing these populations.

Learning Objective: Participants will be aware of the diverse associations between ethnicity, psychosocial factors, and breast cancer screening.

Poster to be presented at the American Society of Preventive Oncology, Philadelphia, PA, March 10th, 2003

Cervical Cancer Screening Among Women at Risk for HIV: Psychosocial and Lifestyle Correlates. **H. Soler-Vila** and D.F. Sly.

Purpose: Low-income women suffer an excess of invasive cervical cancer (ICC) related deaths, a highly preventable disease through early detection (Pap Smear). We analyzed data on low-income, ethnically diverse women at risk for HIV/STDs to identify psychosocial and health lifestyle correlates of regular Pap Smears (Pap). Since ICC is an AIDS-defining illness, documented under-utilization in this population is of great concern. Further, reported racial/ethnic differentials may reflect culture-related barriers and/or facilitators of Pap. Methods: Data come from face-to-face interviews of non HIV-infected, non-pregnant women recruited for an HIV prevention intervention project. Multivariate analyses included 551 women (26% African-American, 32% White, and 41% Hispanic) at risk for HIV/STDs living in South Florida. Results: Fully-adjusted results show that African-American women and those 35 and over are less likely to report a recent Pap than their counterparts. Internal locus of control, self-efficacy, and benefit-related unmet needs were associated to screening as expected. Further, although obese women were more likely to be screened, no lifestyle behaviors (e.g., smoking) predicted screening. However, interaction terms reveal that these associations vary by race/ethnicity and HIV/STD-risk level. Conclusions: These variations are crucial for identifying underserved, high-risk women, designing health interventions, and educating health providers servicing these populations.

Abstract to be presented as a poster at ASPO, Philadelphia, March 10th, 2003.

Stressful Life Events and Compliance with Mammography Screening Guidelines Among African-American and White Women. **H. Soler-Vila**, L. Calvocoressi, S.V. Kasl, C. Lee, and B.A. Jones.

Regular screening is needed for detection of breast tumors at a treatable stage. Low-income and minority women report lower levels of regular screening. We examined the influence of recent life events on adherence to screening mammography guidelines (adherence) in a cohort of 1,229 women (39% African-American and 61% White), ages 40-79, who completed a baseline interview about 1 ½ months, after an "index" screening exam and a follow-up interview 29 months later, on average. Multivariate analyses adjusting for socio-demographic factors, access to care, mammography screening history, perceived risk to breast cancer, perceived usefulness of screening, knowledge of guidelines, receiving a doctor's recommendation and reminders, showed that experiencing at least one stressful event during the 2-year follow up was associated with non-adherence only among certain groups: women between 40 and 49, and those with less than a high school education. These results suggest a plausible mechanism through which stressful life events may influence stage at diagnosis, and thus breast cancer prognosis, among younger women and women with lower education levels. Further, this study identifies a key factor which may put certain women at risk for non-adherence and which should be addressed in interventions to promote adherence to guidelines.

Abstract submitted to Society for Epidemiological Research, Atlanta, GA. June 2003.

Obesity and Survival in a Cohort of African American and White Women with Breast Cancer.
BA Jones, C Dallal, **H Soler-Vila**, SV Kasl, D Zelterman, M Lachman, C Howe, and F Duan

Five year relative survival rates are lower in African American (AA) women than in White (W) women, even after adjustment for observed differences in stage at diagnosis. Given that AA women are more likely to be overweight or obese than are W women, our aim was to: 1) evaluate the role of obesity (at diagnosis) on survival in a cohort of AA and W women with breast cancer; and 2) determine if differences in obesity contribute to observed racial/ethnic differences in survival after adjustment for known prognostic factors. In a follow-up study of a population-based cohort of 145 AA and 177 W women diagnosed between 1/87 and 5/89, all cause mortality (ACM), breast cancer death (BCD), and disease free survival (DFS) were ascertained from the Connecticut Tumor Registry and physician questionnaire in 1999. Body mass index (BMI) (weight (kg)/height (m)^2) was calculated using data recorded in the medical record at time of biopsy; extensive data was collected shortly after diagnosis by in-person interview and medical record abstraction. Survival analysis demonstrated that obese women (BMI $\geq$ 30.0 kg/m$^{2<}$) were more likely than normal weight women to die from any cause (Hazard Ratio (HR) =1.75; 95 percent Confidence Interval (CI) 1.04, 2.96), after adjustment for sociodemographic factors, 3 measures of socioeconomic status (SES), access to health care, menopausal status, lifestyle factors, TNM stage at diagnosis, comorbid conditions, and treatment. Results were similar for BCD (not significant) and DFS. After adjustment for TNM stage and SES, severe obesity reduced the HR for race to nonsignificance (HR for race = 1.34, (95% CI 0.87 – 2.06). These results demonstrate an independent role for obesity in predicting mortality in breast cancer patients, as well as a possible explanatory role in the relatively poorer stage-adjusted survival observed in AA women.

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